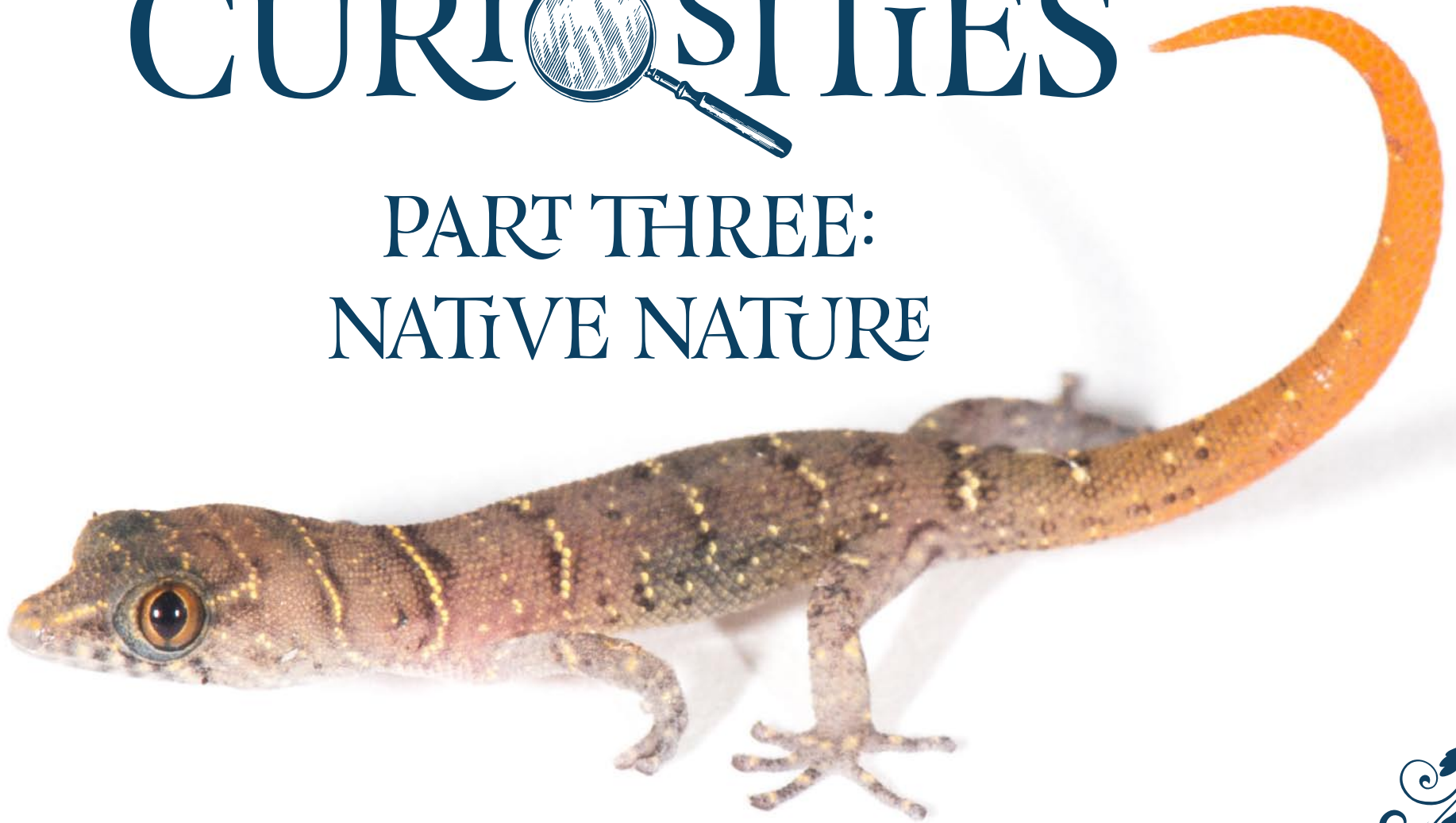


CARIBBEAN CURIOSITIES

PART THREE: NATIVE NATURE



By Mark Yokoyama

Origin Stories

The Caribbean is full of stories. There are stories of people and events, tall tales and true ones. Nature in the Caribbean is full of stories, too. Birds travel thousands of miles each year to connect these islands with faraway lands. Natural landscapes are transformed over and over again. New species—brought on purpose or by accident—bring death and destruction to local ecosystems.





Some of the best stories are origin stories. How did these creatures get onto these little islands in the sea? How did they transform into new forms that don't exist anywhere else? How did they come together into unique communities? The unique wonders of Caribbean nature all blossom from chance beginnings, incredible journeys and the isolation of distance.

Blessed with an incredible variety of unique animals found nowhere else, the Caribbean makes a wonderful laboratory. We have the opportunity to investigate the big ideas of biology, like adaptation, competition and extinction. We can compare each island to its neighbor, and learn from the differences. Here we can learn how diversity came to be.

Right now, the Caribbean is a fascinating place to do science. Although it is not as remote as it once was, in many areas work is just now beginning. There are hundreds, or even thousands of new species waiting to be discovered and described—new origin stories waiting to be told.



The Caribbean is undergoing great changes. The region is no stranger to change. Populations have risen and fallen. Crops have been exploited and abandoned under the influence of global markets. The pace of development—especially on St. Martin—surely tests the resilience of the island's ecosystem. Some of our unique animals have already disappeared.



It is the perfect time to learn about the wild wonders around us. The tools at our disposal are better than ever, and the need has never been more urgent. Much natural heritage is on the edge of destruction, even as a new generation becomes inspired to protect it. We have the chance to celebrate what makes the island unique in an era when local customs are being swallowed up by global culture. This is the moment to learn and share the stories of our exceptional native animals.



On Evolution's Trail

Evolution is happening all around us, but the processes that create new species are also being undone at the same time.

There are no bird species that live only on St. Martin. It's not too surprising—on a clear day you can watch birds flying across to Anguilla or arriving here from Saba. Some birds even fly thousands of miles to live here each winter. But not all birds are such avid travelers.

Many of the birds on St. Martin are found only in our region. You can often tell by the names, like Lesser Antillean Bullfinch, Caribbean Elaenia, Antillean Crested Hummingbird, Carib Grackle and Green-throated Carib. Some other local birds have wider ranges, but distinct subspecies or varieties in the Caribbean. Although they can fly across the sea, they usually don't.

Like all living things in nature, these birds are in the process of evolving. Over generations, Sugar Birds on St. Martin might adapt ever so slightly to the conditions on this island. They might get better at harvesting nectar from the flowers found here or nesting out of the reach of the mongoose. These could be the first invisible steps towards becoming a St. Martin Sugar Bird, found nowhere else in the world.



While this is happening, other events are reversing this evolution. A hurricane strike on a nearby island might send desperate birds here in search of food. As they integrate with the local Sugar Bird population they smooth out the tiny differences that were beginning to develop in the St. Martin population. The balance of isolation and movement can create regional varieties that never develop into distinct new species.





The ability to analyze genetic differences has given us a window into the subtle differences between Sugar Birds and a look into their past. A recent study compared over 40 different Sugar Birds from different areas with surprising results. Over the past several million years, there have been three separate periods when Sugar Birds from the Greater Antilles expanded into the Lesser Antilles. Each new wave mixed with the Sugar Birds here, and the birds living here today still carry the evidence of these movements in their genes.

Have Wings, Will Travel

Animals have developed the power of flight several times. The insects were the first to take to the skies, and they became the most diverse group of animals in the world. Feathered dinosaurs grew wings and became birds, surviving when the rest died out. A third group used flight to colonize St. Martin while their fellow mammals could not.

Bats are St. Martin's only native mammals. At least, they are the only ones alive today. Two prehistoric rodents lived on St. Martin, but they were long gone by the time recorded history began here. All other mammals on the island were brought by humans. This includes the wild ones—rat, mongoose, mongoose, raccoon, monkey—as well as our pets and farm animals.






Bats have used the power of flight to diversify, adopt many different lifestyles, and travel. There are over 1,000 species of bats in the world, and eight are found on St. Martin. Our bats pursue a variety of foods and make their homes in a variety of places.

The Velvety Free-tailed Bat eats insects and often lives beneath corrugated zinc roof sheets. It is a small bat, often seen in neighborhoods. It comes out around dusk to catch flying insects. To our benefit, mosquitos are often part of its dinner.

The Jamaican Fruit Bat and Antillean Cave Bat are larger, and they eat fruit. They are often seen around fruit trees at night, including almond, mango and palm trees. These bats nest in large groups in caves, especially the Grotte du Puits in the lowlands. The floor of the cave is covered in fruit pits brought back to the cave by the bats.

A large colony of Fisherman Bats is shown hanging from a cave wall. The bats are densely packed in the center, with many others scattered around. They have dark, leathery wings and small, pinkish faces. The cave wall is a light brown, textured surface. The text is overlaid on the bottom left of the image.

One of our most remarkable bats is the Fisherman Bat. This species uses echolocation to sense ripples made by fish on the surface of the water. Then it swoops down and grabs the fish with its large feet. Of course, all of this is done in complete darkness!

Bats have adapted to Caribbean islands, becoming new species along the way. The Antillean Cave Bat is found only in the Caribbean. The Lesser Antillean Tree Bat and Lesser Antillean Funnel-eared Bat are found only in the Lesser Antilles. The only mammals to fly, and our only native mammals, they have truly made the Caribbean their home.



Between Worlds

On St. Martin, one is never far from the sea. Most obviously, we find it at the edge of every beach and at the bottom of each seaside cliff. But the sea also has ways of invading the island itself.

The sea seeps into the land through the porous limestone, adding its salty essence to well water. It washes upstream in the few spots where fresh water running down a gut reaches the sea. And, of course, salty water from the sea fills many of our salt ponds.

These brackish waters—neither part of the sea, nor totally separate from it—are a rich and unique habitat. The creatures that live here must adapt to the changing conditions of this zone: a rainstorm pushing the balance towards freshness, a dry spell pushing it to salty.



For some, life between two worlds is just a passing phase. Many juvenile fish use brackish mangrove wetlands as a nursery. In the shallow water, sheltered in mangrove roots, they find a safe place to grow. They then swim out to the coral reef to live. Some freshwater species—like the Mountain Mullet and many freshwater shrimp—float in the sea as eggs. After hatching they travel with the current, then swim into fresh water to mature.

Fish like the Crested Goby spend a lifetime on the borderline. They often live around mangroves, digging out a hollow in the sand or finding a root-sheltered hiding spot. They also live in estuaries where streams and rivers empty into the sea. Unlike most fish, they can live perfectly fresh water, pure seawater and anything in-between.



The Crested Goby is also flexible when it comes to food. Algae is on the menu, but so are crabs, insects, snails and even small fish. It is an integral part of the wetland community that captures nutrients washed down from the island. It plays a part in keeping the seas both clean and full of life.

The adaptable Crested Goby has found a niche that allows it to occupy the cracks and crevices between two worlds. In doing so, it has also turned its back on life in the open ocean. It is a creature of the sea, tied forever to the edge of the land.





The Little Things

They're all around us, but we rarely notice them. They're specially-equipped for climbing, but mostly live on the ground. They're probably the most common reptiles on St. Martin, but few people know their names.

St. Martin's dwarf geckos are some of its most unique and mysterious residents. The island has two species. The smaller one is known as the Little Woodslave or Anguilla Bank Dwarf Gecko. The larger is called the Least Island Gecko or Leeward Banded Dwarf Gecko. Hidden in their confusing names are some clues to how unique they are.

The Little Woodslave is found on only a few islands in the world: Anguilla, St. Martin, St. Barts and the smaller islets in the immediate area. Combined, these islands make up the Anguilla Bank featured in the name Anguilla Bank Dwarf Gecko. When the last ice age lowered sea levels by locking water in glaciers, these islands were connected into a larger island. Hop over to Saba or Statia—which have never been connected to St. Martin—and you won't find the Little Woodslave. Its cousin, the Saban Dwarf Gecko, lives there.

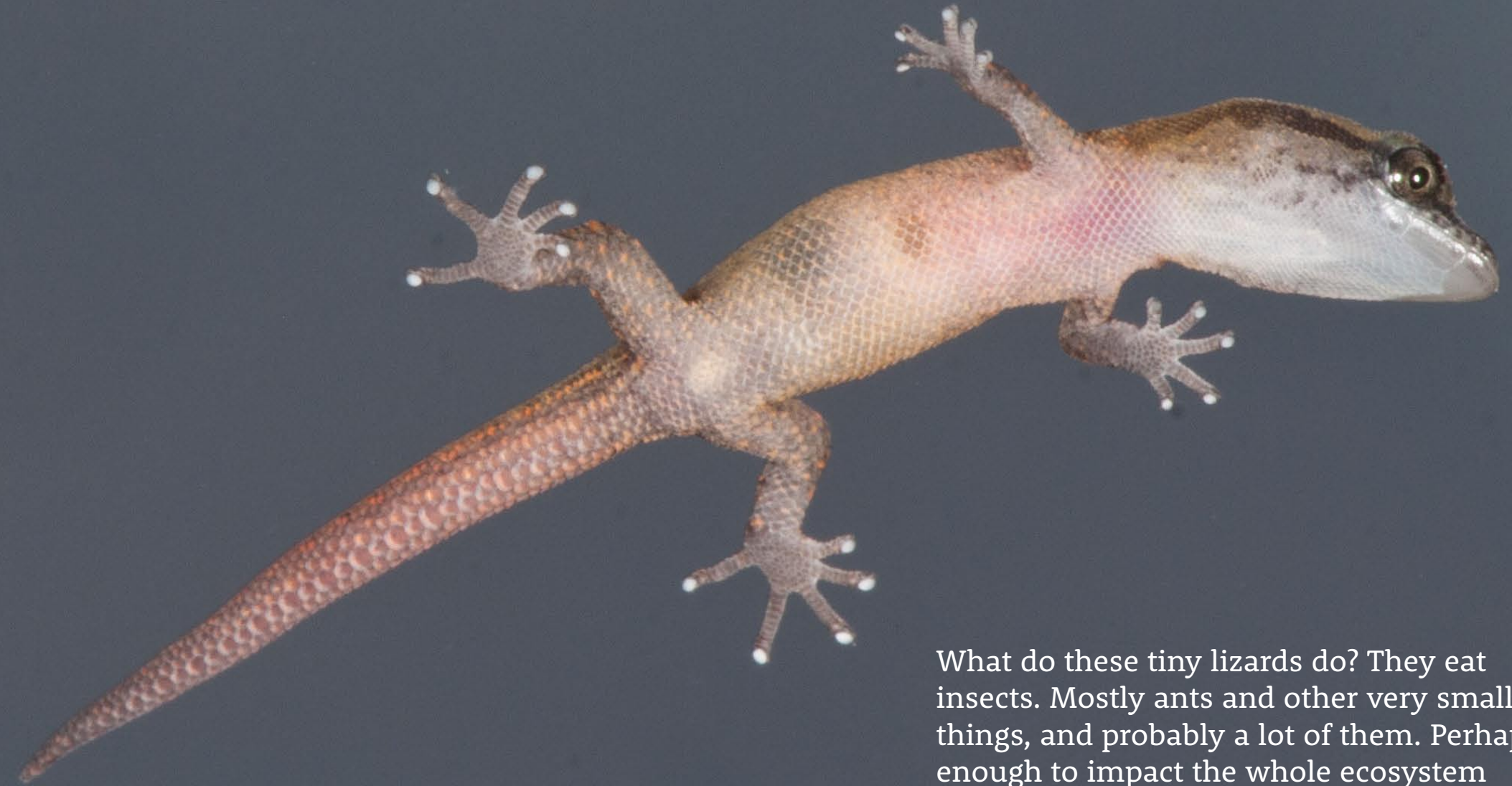
It's hard to say what the name Least Island Gecko is supposed to mean. It doesn't live on the fewest islands—it's found from Anguilla down to Nevis. It also isn't the smallest—there is a smaller dwarf gecko on every island where it lives. Its other name, Leeward Banded Dwarf Gecko, isn't much better. Sometimes they are banded, but other times not at all.



Dwarf geckos may be small, but they do have strength in numbers. There are over 100 species of dwarf gecko in the genus *Sphaerodactylus*, and the vast majority live only in the Caribbean. This vibrant diversity is one reason the Caribbean is considered a biodiversity hotspot.

In terms of population, one study measured dwarf gecko density equivalent to 21,000 geckos per acre. In theory that would work out to about 450 million dwarf geckos on St. Martin, if the entire island were perfect habitat for them. Probably there are far fewer, but the real number could be almost unimaginably high.





What do these tiny lizards do? They eat insects. Mostly ants and other very small things, and probably a lot of them. Perhaps enough to impact the whole ecosystem of the island. They turned their miniature size into an advantage that made them incredibly successful. In the Caribbean, their tiny feet leave a big footprint.

The Last Refuge

The ravines on the western slope of Pic Paradis feature a forest unlike anything else on St. Martin—or neighboring Anguilla and St. Barts for that matter. It is the homeland of our Bearded Anole, and may have been its birthplace, too.

In ecology, endemic means something that is only found in one specific place. There are a couple ways this can happen. A neoendemic species is a new species that evolves in a unique location. This happens a lot on islands. The term paleoendemic describes almost the opposite situation: the last refuge of a species that was once more widespread. This can happen on an island, too.



Our beautiful Bearded Anole—like most of our native reptiles—is a great example of a neoendemic species. Little lizards spread from island to island, blossoming into a wide variety of species as they adapted to their new homes. Lush forest may have been ancestral home of this species. It is ill-suited to the full heat of the tropical sun, and is primarily found in shady areas.



For most of the last 100,000 years, the Bearded Anole probably had lots of habitat. Sea levels were lower, and St. Martin was part of a much bigger island that included present-day Anguilla, St. Barts and beyond. Surely there were many shady forests where this lizard could live.

Around 12,000 years ago, rising sea levels separated St. Martin, Anguilla and St. Barts. The Bearded Anole probably lived on all three islands, but St. Barts and Anguilla are both lower than St. Martin. Because of this, they lacked the water and wind protection to develop the type of broadleaf forest that stretches from Colombier up to Pic Paradis.



We have no record of the Bearded Anole on St. Barts, and it was last recorded on Anguilla in the 1920s. Today it lives only on St. Martin, a relict population in its last refuge. It is both a neoendemic species that arose here, and a paleoendemic species that disappeared from the other places it lived.

Many of nature's most miraculous creatures evolved on islands. They make up a tiny percentage of the land mass of the earth, but are home to much of the planet's diversity. Unfortunately, over half of animal extinctions have also happened on islands, a trend that continues. The individuality of the island—in richness and struggle—is reflected in our Bearded Anole.



Hiding in Plain Sight

People have spent more than 200 years systematically describing and naming the plants and animals around us. One could be forgiven for thinking that process is winding down. The truth is almost the opposite: we're still finding about 10,000 new species of animals every year.

To be fair, many of these new species are insects. We've described about a million insect species, but there may be six to ten million more to go. But we're also discovering bigger animals: lizards, frogs, birds and even whales.

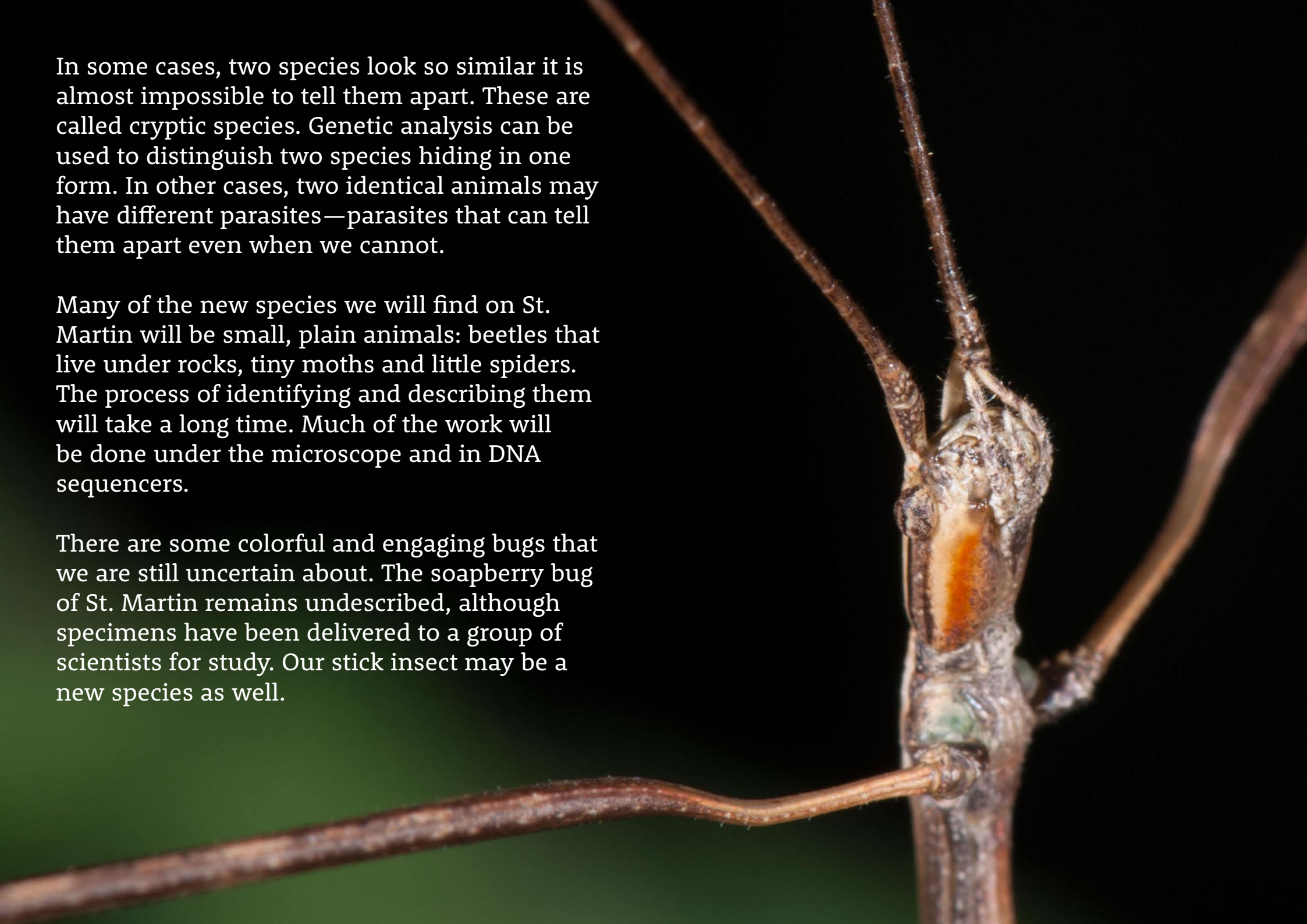
Chances are, there are unknown species right here on St. Martin. We've already become the home of three "new" lizard species in the 21st century. None of them were unknown exactly, but none of them were considered distinct species until recently. The Bearded Anole, for example, was considered a subspecies of Watts' Anole until DNA analysis determined that they had more differences than we thought.



In some cases, two species look so similar it is almost impossible to tell them apart. These are called cryptic species. Genetic analysis can be used to distinguish two species hiding in one form. In other cases, two identical animals may have different parasites—parasites that can tell them apart even when we cannot.

Many of the new species we will find on St. Martin will be small, plain animals: beetles that live under rocks, tiny moths and little spiders. The process of identifying and describing them will take a long time. Much of the work will be done under the microscope and in DNA sequencers.

There are some colorful and engaging bugs that we are still uncertain about. The soapberry bug of St. Martin remains undescribed, although specimens have been delivered to a group of scientists for study. Our stick insect may be a new species as well.





Does it matter if we identify all the tiny creatures that live on St. Martin? In some ways, it could be more an issue of philosophy than practicality. Who would we be if we lost the desire to learn more about the world around us? On the other hand, perhaps this seemingly obscure knowledge does have a future use. Could we someday bring life to a distant planet without understanding it first here on earth?



This ebook was created by Mark Yokoyama based on articles published in *The Daily Herald's* Weekender section, which is edited by Lisa Davis Burnett. Each article highlights a species featured at Amuseum Naturalis, St. Martin's first natural history museum. Amuseum Naturalis is a free, public pop-up museum of the natural history of St. Martin and the Caribbean, created by Les Fruits de Mer and made possible by the generous sponsorship of Delta Petroleum. Visit the Amuseum for free on Tuesdays and Thursdays from 4-8pm at 96 Boulevard de Grand Case in Grand Case or online at <http://amuseumnaturalis.com>.



This ebook is a companion to the 2017 Endemic Animal Festival, a free public event for all ages that celebrates St. Martin/St. Maarten's unique wildlife and natural heritage created by Les Fruits de Mer. It's a fantastic opportunity to learn about the animals that only live on this island or in our region. The 2017 event features an Endemic Animal Discovery Station, a Club Gaïac seedling giveaway, local wildlife-themed art activities and more. It will take place at Amuseum Naturalis at 96 Boulevard de Grand Case on Sunday, April 23rd from 9am-3pm. The festival is made possible by the generous support of its sponsors: Delta Petroleum, Hotel L'Esplanade, IGY Marinas, Lagoones Bistro & Bar, L'Esperance Hotel, Rain Forest Adventures, The Scuba Shop, Sonesta Great Bay Beach Resort, Casino & Spa, Sonesta Maho Beach Resort & Casino and Tri-Sport.



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